OPA



RICHARDS CORPORATION

55 East Center Pleasant Grove, UT 84062 • (801) 785-2500 • Toll free: (800) 453-1210 • Fax: (801) 785-2521

THIS MESSAGE IS INTENDED ONLY FOR THE USE OF THE INDIVIDUAL TO WHOM, OR ENTITY TO WHICH, IT IS ADDRESSED AND MAY CONTAIN INFORMATION THAT IS PRIVILEGED, CONFIDENTIAL AND EXEMPT FROM DISCLOSURE UNDER APPLICABLE LAW.

If the reader of this message is not the intended recipient or the employee or agent responsible for delivering the message to the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication is prohibited. If you have received this communication in error, please notify us immediately by telephone (collect). Thank you

Date: 9-9-94 Please deliver this message to: Name: HAYS GREISWALD Company: EPA Telephone Number: <u>303-294-708</u> Fax Number: 303- 394- 7168 From: Robert Richards Richards Corporation 55 East Center

Pleasant Grove, UT 84062

Fax Number: (801)785-2521

Telephone Number: (801)785-2500

We are transmitting _______ pages, including this cover sheet. If the transmission is not complete, please call: (801) 785-2500

99.15.23

RICHARDS INDUSTRIAL MICROBIOLOGY LABORATORY • 55 East Conter • Pleasant Grove, Utah 84052 • (801) 785-2500 • Salt Leke: (801) 355-5573 • Watte: (800) 453-1210

OPA

Summary of Questar's UST Pilot

The purpose of this study was to determine if the bacteria which Richards Industrial Microbiology Laboratory has developed can be used to break down the hydrocarbon contaminated water in the 12,000 gallon UST on Questar Pipelines property located in Vernal, Utah.

In connection with the initial investigation of the suspected release, Questar drained the UST and began evaluations. To confirm the tanks integrity, a tightness test was performed, to do this the tank had to be full. Richards pumped water from a ground water production well which was contaminated with free product, into the UST to prepare for the tightness test. The test was performed and the tank tested tight.

At the request of Questar Pipeline, Richards was asked to perform the remediation of the UST as a pilot study to show the usefulness of bioremediation.

The UST was sampled and found to have five inches of gas floating on the top of the water. Richards installed a skimmer pump into the UST and let it pump until 8:00 a.m. on March 11, 1994 removing about 25 gallons of free product. There was a small amount of free product left in the tank, exactly how much is not known. The UST was then sampled again for the beginning sample. An air line with an eight foot steel pipe with 1/16 inch holes drilled in it was lowered to the bottom of the UST and air from Questar's shop was pumped into the tank for two hours before the bacteria were introduced.

At 10:00 a.m. on March 11, 1994 the bacteria and the necessary nutrients were added to the UST. The UST was sampled at 3:00 on March 21, 1994—a total 199 hours with the supply of air and nutrients (8-24 hour days). The laboratory results below show the reduction of the BTEX and TPH hydrocarbons in the UST.

The water temperature at the beginning of the test was 53° F and was at 49° at the ending time. The drop in temperature was due to cold air being pumped into the water.

99.15.23



INC | INC | SE East Center • Pleasant Grove, Utah 84062 • (801) 785-2500 • Salt Lake: (801) 355-5579 • Watts: (800) 453-1210 • Fex: (801) 785-2521

Gas Chromatography Method 602

Client:	<u>Ouestar</u>
---------	----------------

Sample ID/Date: Vernal Site, UST 1 3/11/94

Mattrix/Log #: Water 1675G Analyzed: 602 3/18/94 P.M.

Analyte	Concentration in PPB	Detection Limit in PPB
Benzene	33,690	<5
Toluens	70,305	<5
Ethylbenzene	6,876	<5
Total Xylene	30,187	₹5
Napthalene		
Total BTEX	141,058	<5
TPH		

Comments: 1,000 times dilution made to achieve above results.

Client: <u>Questar</u>

Sample ID/Date: Vernal Site, UST #1 3/21/94

Mattrix/Log #: Water 1685G Analyzed: 602 3/22/94 P.M.

Analyte	Concentration in PPB	Detection Limit in PPB
Benzene	ND	<5
Toluene	43.21	<5
Ethylbenzene	ND	<5
Total Xylene	183.04	< 5
Napthalene		
Total BTEX	226.25	<5
ТРН	10/12	

Comments: A 10x dilution was performed on sample to achieve above results.

Peggy McNicol, Chemist

RICHARDS INDUSTRIAL MICROBIOLOGY, INC. 55 EAST CENTER PLEASANT GROVE, UT 84062

							1-800	0-453-1210	1-80	11-78	5-250	<u> </u>			
CUSTOMER I	NAME:	(Vuc	ifai		(is:	-)									
SAMPLER:	Rob	ert	Ru	her	(vi			NUMBER (IF	$ _{\beta_{-}}$						remarks
SAMPLE NUMBER	DATE	TIME	С О М	G R A		LOCATION		CONTAINERS	CHEXX	PH					·
7	3/4/14	5:00	P	U	UST	Before Ba	cT	3	//						High Goos -
	7.7.7											-			
	-		-	-					-						
				<u> </u> -					-						
		 	╢-	-											
	1		-	1			1-12-2								
SAMPLES X	ELINQUIS	HED	D	ATE	TIME	SAMPLES R	ECEIVI	ED .		D.	ATE	TD	ME		REASON FOR TRANSFER
Mile II	ad	unes	3	114/4	1:50		N	Jupantin		3/1	4/171	.5	D	2	certific
			_ _			+//-		\		 					
			1-												
		. (-					
Ŋ.					ı	1		•	• •	1		i			

RICHARDS INDUSTRIAL MICROBIOLOGY, INC. 55 EAST CENTER PLEASANT GROVE, UT 84062 1-800-453-1210 1-801-785-2500

CHICKER ON A							1-00	(J-453-1210	1 5		J-230			
SAMPLES BELINQUISHED SAMPLES RELINQUISHED DATE TIME C G O R LOCATION CONTAINERS F F B LOCATION CONTAINERS F F F F F F F F F F F F F F F F F F F								NUMBER	B	T				
SAMPLES RELINQUISHED DATE TIME SAMPLES RECEIVED DATE TIME REASON FOR TRANSFER BY: I Minut Kulayl 3/22 11:01	SAMPLE HUMBER	4		с о м	G R A	•	CATION		1.54	, ,				REMARAS
SAMPLES BELINQUISHED DATE TIME SAMPLES RECEIVED DATE TIME REASON FOR TRANSFER BY: I Minut Kukuyla 3/22 11:01 I Minut Kukuyla 3/22 11:01	1	2.2	3 30		7	1157		2	-					
SAMPLES RELINQUISHED BY: Nort Kukaylo 3/22 11:01 Migrat Kukaylo 3/22 11:01		12/	370			0.01								
SAMPLES RELINQUISHED BY: Nort Kukaylo 3/22 11:01 Might Kukaylo 3/22 11:01				 										
SAMPLES RELINQUISHED BY: Nort Kukaylo 3/22 11:01 Might Kukaylo 3/22 11:01				 										
SAMPLES RELINQUISHED BY: Nort Kukaylo 3/22 11:01 Might Kukaylo 3/22 11:01				-	-									
SAMPLES RELINQUISHED BY: Nort Kukurl 3/22 11:01			 -	-	-									
SAMPLES RELINQUISHED BY: Nort Kukurl 3/22 11:01			 	∥	-	 								
SAMPLES RELINQUISHED BY: Nort Kukurl 3/22 11:01				 	╁—				-	 				
SAMPLES RELINQUISHED BY: Nort Kukurl 3/22 11:01	Ĭ	ļ <u></u>	-	╢	╂	ļ			-	1				
10/10st Kukarls 3/22 11:01 Sound 1 Am sale 3/20/11 11:51	lk .	ELINQUISI	(ED	α	ATE	TIME		ED	سجدك	D	A)'E	TR	ME	REASON FOR TRANSFER
	1 novered	1/1/1	Quel-	3/	22	11:01	J. V	Air, salz		3/2	2/9.1	11:0	1	
	X (4.5	71.020	Crop Land	7.		1	7)	天)						
				┪		 	1	1						
				+		-					•			
				-	·	 	-			1				
						-	<u> </u>			-				



Summary of Questar's UST Pilot

The purpose of this study was to determine if the bacteria which Richards Industrial Microbiology Laboratory has developed can be used to break down the hydrocarbon contaminated water in the 12,000 gallon UST on Questar Pipelines property located in Vernal, Utah.

In connection with the initial investigation of the suspected release, Questar drained the UST and began evaluations. To confirm the tanks integrity, a tightness test was performed, to do this the tank had to be full. Richards pumped water from a ground water production well which was contaminated with free product, into the UST to prepare for the tightness test. The test was performed and the tank tested tight.

At the request of Questar Pipeline, Richards was asked to perform the remediation of the UST as a pilot study to show the usefulness of bioremediation.

The UST was sampled and found to have five inches of gas floating on the top of the water. Richards installed a skimmer pump into the UST and let it pump until 8:00 a.m. on March 11, 1994 removing about 25 gallons of free product. There was a small amount of free product left in the tank, exactly how much is not known. The UST was then sampled again for the beginning sample. An air line with an eight foot steel pipe with 1/16 inch holes drilled in it was lowered to the bottom of the UST and air from Questar's shop was pumped into the tank for two hours before the bacteria were introduced.

At 10:00 a.m. on March 11, 1994 the bacteria and the necessary nutrients were added to the UST. The UST was sampled at 3:00 on March 21, 1994—a total 199 hours with the supply of air and nutrients (8-24 hour days). The laboratory results below show the reduction of the BTEX and TPH hydrocarbons in the UST.

The water temperature at the beginning of the test was 53° F and was at 49° at the ending time. The drop in temperature was due to cold air being pumped into the water.

INC 5 East Center • Pleasant Grove, Utah 84062 • (801) 785-2500 • Salt Lake: (801) 355-5579 • Watts: (800) 453-1210 • Fax: (801) 785-2521

Gas Chromatography Method 602

Client: <u>Questar</u>

Sample ID/Date: Vernal Site, UST 1 3/11/94

Mattrix/Log #: Water 1675G Analyzed: 602 3/18/94 P.M.

Analyte	Concentration in PPB	Detection Limit in PPB
Benzene	33,690	<5
Toluene	70,305	<5
Ethylbenzene	6,876	<5
Total Xylene	30,187	<5
Napthalene		
Total BTEX	141,058	<5
ТРН		

Comments: 1,000 times dilution made to achieve above results.

Client: <u>Questar</u>

Sample ID/Date: Vernal Site, UST #1 3/21/94

Mattrix/Log #: Water 1685G Analyzed: 602 3/22/94 P.M.

Analyte	Concentration in PPB	Detection Limit in PPB
Benzene	ND	<5
Toluene	43.21	<5
Ethylbenzene	ND	<5
Total Xylene	183.04	<5
Napthalene		
Total BTEX	226.25	<5
ТРН	1242	

Comments: A 10x dilution was performed on sample to achieve above results.

Peggy McNicol, Chemist

CHAIN OF CUSTODY REPORT

RICHARDS INDUSTRIAL MICROBIOLOGY, INC. 55 EAST CENTER PLEASANT GROVE, UT 84062 1-800-453-1210 1-801-785-2500

		_					0-433-1210		71-70.	_				
CUSTOMER I	NAME:	Yucs	far		(is	-)								
SAMPLER:	Rob	ert	Ru	lea	(v) 1d0		NUMBER OF	13						
SAMPLE NUMBER	DATE	TIME	C O M P	G R A B		LOCATION	CONTAINERS	BILEXX	TP#					REMARKS
	3/11/14	9:00		V	UST	Before BACT	5						-	-High Gins -
						· · · · · · · · · · · · · · · · · · ·								
			 											
						· · · · · · · · · · · · · · · · · · ·								
SAMPLES RE BX:			DA	TE	TIME	SAMPLES RECEIVE	ED	<u> </u>	1	TE	TDV	1		REASON FOR TRANSFER
Polent	July	uds	3/	4/44	1:50	O N	Jugarahi		3/1	1/24	1:57	2	Ru	culvine
			-			 () 	\		'-	-				
			-				· · · · · · · · · · · · · · · · · · ·		 					¥ .
									<u> </u>					

CHAIN OF CUSTODY REPORT

RICHARDS INDUSTRIAL MICROBIOLOGY, INC. 55 EAST CENTER PLEASANT GROVE, UT 84062

1-800-453-1210 1-801-785-2500

CUSTOMER N	NUMBER 3													
SAMPLE NUMBER	DATE	<u> 7677 7</u> TIME	C O M P	G R A B	und	OCATION	OF CONTAINERS	101-1××	TRIT					REMARKS
	3-21	3 30		/	UST		2	/	_					
							•						·	
													·	
SAMPLES RE BY;	SAMPLES RELINQUISHED DATE TIME SAMPLES RECEIVED BY:					: D		DA	(TE	TIM	Œ	i I	REASON FOR TRANSFER	
Kolvent	Kick	wel-	3/3	12	11:01	Jana N	Ligrals		3/2-	771	Hic	1		
						()	\(\)	· · · ·	<u> </u>	•				
			├											